



Custom Peptide Storage and Dissolution

Peptide Storage

Custom peptides are supplied as lyophilized material and shipped in glass vials. Peptides are shipped at room temperature. Upon receipt, store peptides at -20 or -80 °C. Store peptides in lyophilized form for up to a year.

When reconstitution is necessary, allow the vial to equilibrate at room temperature before opening. Remove only the material necessary and blanket the unused portion with argon or another inert gas, cap the vial, and return the vial to the freezer.

Peptide Dissolution

The solubility of the peptide depends on the charge and hydrophobicity of a peptide. The solvent is chosen based on the following factors:

- Nature (acidic, basic, or hydrophobic) of the peptide (see page 2)
- Compatibility of the solvent with downstream applications
- Stability of the peptide in the solvent (solvent must not react or promote degradation of the peptide)

If you are unsure of the nature of the peptide, refer to the table on pages 3-4. This table lists the charge and hydrophobicity for each amino acid and enables you to determine if the peptide is charged or hydrophobic. After determining the charge and hydrophobicity of the peptide, choose an appropriate solvent for the peptide (see **Water Soluble Peptides, Acidic Peptides, Basic Peptides, and Hydrophobic Peptides**, next page).

To avoid degradation, dissolve peptides in degassed, sterile, distilled water or an appropriate solvent. Once a peptide is dissolved, use within a week and store blanketed with an inert gas. Avoid repeated freezing and thawing of peptide solutions.

Part No. 12543000.pps

Rev. Date: 06/06/03

This product is distributed for laboratory research only. CAUTION: Not for diagnostic use. The safety and efficacy of this product in diagnostic or other clinical uses has not been established.

For technical questions about this product, call the Invitrogen Tech-Line™ U.S.A. 800 955 6288

Recommendation

We recommend testing a small amount of the peptide for solubility in water or various solvents prior to dissolving the entire amount of peptide.

Water Soluble (Hydrophilic) Peptides

For peptides that are hydrophilic (due to the presence of >25% charged residues such as glutamic acid, aspartic acid, lysine, arginine, and histidine), dissolve peptides in distilled water. For peptides insoluble in water, see below.

Acidic Peptides

For peptides that are acidic (due to the presence of aspartic and/or glutamic acid residues), add a small amount of 5% ammonium hydroxide. Once the peptide is dissolved, you can dilute the peptide with water or aqueous buffered solution to the desired concentration. Avoid basic conditions when reconstituting peptides that contain cysteine.

Basic Peptides

For peptides that are basic (due to the presence of histidine, lysine, and/or arginine residues), add a small amount of 5% acetic acid. Once the peptide is dissolved, you can dilute the peptide with water or aqueous buffered solution to the desired concentration.

Hydrophobic Peptides

For peptides that are hydrophobic (>50% hydrophobic) due to the presence of isoleucine, leucine, phenylalanine, and/or valine residues, dissolve the peptide in minimal amount of DMSO, DMF, acetonitrile, isopropyl alcohol, or ethanol. Once the peptide is dissolved, slowly add (in drops) the peptide to a stirred aqueous buffered solution to dilute the peptide to the desired concentration. If the resulting peptide solution begins to show turbidity, the solubility limit of the peptide is reached.

Oxidation of Peptides

Peptides containing cysteine and methionine are susceptible to oxidation when exposed to air. To avoid oxidation, dissolve peptides in degassed, distilled water or an appropriate solvent.

Amino Acid Table

The table below lists the charge, hydrophobicity, and molecular weight for D- and L-forms of all amino acids. Determine the net charge and hydrophobicity of the peptide using this table.

The molecular weights listed in the table below are based on average mass weight without residual water of each coupled amino acid.

Note: Very hydrophobic amino acids: W>I>F>L

Hydrophobic amino acids: C>M>V>Y

Amino Acid	Charge	Hydrophobicity*	Molecular Weight
L-Alanine (A)	0	0.310	71.08
L-Cysteine (C)	0	1.540	103.14
L-Aspartic Acid (D)	-1	-0.770	115.09
L-Glutamic Acid (E)	-1	-0.640	129.12
L-Phenylalanine (F)	0	1.790	147.18
Glycine (G)	0	0.000	57.05
L-Histidine (H)	1	0.130	137.14
L-Isoleucine (I)	0	1.800	113.16
L-Lysine (K)	1	-0.990	128.17
L-Leucine (L)	0	1.700	113.16
L-Methionine (M)	0	1.230	131.20
L-Asparagine (N)	0	-0.600	114.10
L-Proline (P)	0	0.720	97.12
L-Glutamine (Q)	0	-0.220	128.13
L-Arginine (R)	1	-1.010	156.19
L-Serine (S)	0	-0.040	87.08
L-Threonine (T)	0	0.260	101.11
L-Valine (V)	0	1.220	99.13
L-Tryptophan (W)	0	2.250	186.21
L-Tyrosine (Y)	0	0.960	163.18
D-Alanine (a)	0	0.310	71.08
D-Cysteine (c)	0	1.540	103.14

Amino Acid Table, continued

Amino Acid	Charge	Hydrophobicity*	Molecular Weight
D-Aspartic Acid (d)	-1	-0.770	115.09
D-Glutamic Acid (e)	-1	-0.640	129.12
D-Phenylalanine (f)	0	1.790	147.18
D-Histidine (h)	1	0.130	137.14
D-Isoleucine (i)	0	1.800	113.16
D-Lysine (k)	1	-0.990	128.17
D-Leucine (l)	0	1.700	113.16
D-Methionine (m)	0	1.230	131.20
D-Asparagine (n)	0	-0.600	114.10
D-Proline (p)	0	0.720	97.12
D-Glutamine (q)	0	-0.220	128.13
D-Arginine (r)	1	-1.010	156.19
D-Serine (s)	0	-0.040	87.08
D-Threonine (t)	0	0.260	101.11
D-Valine (v)	0	1.220	99.13
D-Tryptophan (w)	0	2.250	186.21
D-Tyrosine (y)	0	0.960	163.18
N-Terminal Amino Acid Modifications			
Acetyl	0	0.310	43.05
Free amine	1	-0.990	1.01
Biotin	0	2.000	227.31
Long Chain Biotin	0	1.850	340.47
C-Terminal Amino Acid Modifications			
Free acid	-1	-0.770	17.01
Amide	0	-0.600	16.02
Biocytin amide	0	1.850	370.50

*The hydrophobicity is calculated as described by Fauchere and Pliska (1983), Eur. J. Med. Chem., Vol. 10, pg. 369.

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